Claims:

Amend the claims 1-20 as follows:

Claim 1 (currently amended): A dual-mode transceiver of [[the]] indoor and outdoor [[UWB]] Ultra Wideband (UWB) communications comprising:

an indoor digital enlarged band lowpass-shaping finite impulse response (FIR) transmitter [[FIR]] filter[[s]] for [[the]] an indoor UWB operation;

an outdoor digital enlarged band lowpass-shaping FIR transmitter [[FIR]] filter for [[the]] an outdoor UWB operation; and

a common digital rejected image spectrum FIR transmitter [[FIR]] filter.

Claim 2 (currently amended): The dual-mode transceiver of claim 1 wherein [[the]] two cascade[[d]] [[two]] digital filters of said indoor digital enlarged band lowpass-shaping FIR transmitter [[FIR]] filter and said common digital rejected image spectrum FIR transmitter [[FIR]] filter are used [[for]] to implement[[ing]] an indoor UWB transceiver. mode.

Claim 3 (currently amended): The dual-mode transceiver of claim 1 wherein [[the]] two cascade[[d]] [[two]] digital filters of said outdoor digital enlarged band lowpass-shaping FIR transmitter [[FIR]] filter and said common digital rejected image spectrum FIR transmitter [[FIR]] filter are used [[for]] to implement[[ing]] an outdoor UWB transceiver.

Claim 4 (currently amended): The dual-mode transceiver of claim 1 wherein said common digital rejected image spectrum FIR transmitter[[s]] [[FIR]] filter comprising two filter structures is only one filter that can be used for both ~~of the~~ indoor and outdoor UWB operation modes.

Claim 5 (currently amended): The dual-mode [[UWB]] transceiver of claim 4 wherein said common digital rejected image spectrum FIR transmitter [[FIR]] filter contains two sub-filters, one sub-filter with even filter taps and other sub-filter with odd filter taps.

Claim 6 (currently amended): The dual-mode transceiver of claim 5 wherein said even tap sub-filter and said odd tap sub-filter stored in memory banks are implemented [[with]] in a polyphase structure by controlling a switch.

Claim 7 (currently amended): The dual-mode [[UWB]] transceiver of claim 1 wherein said indoor digital enlarged band lowpass-shaping FIR transmitter [[FIR]] filter coupled to said common digital rejected image spectrum FIR transmitter [[FIR]] filter is a combination interpolation lowpass-shaping FIR transmitter [[FIR]] filter [[with]] by upsampling of 2 for implementing [[an]] the indoor UWB transceiver.

Claim 8 (currently amended): The dual-mode transceiver of claim 1 wherein said outdoor digital enlarged band lowpass-shaping FIR transmitter [[FIR]] filter coupled to said common digital rejected image spectrum FIR transmitter [[FIR]] filter is a combination interpolation lowpass-

shaping FIR transmitter [[FIR]] filter [[with]] by
upsampling of 2 for implementing [[an]] the outdoor UWB
transceiver.

Claim 9 (currently amended): The dual-mode transceiver
of claim 1 wherein said indoor digital enlarged band
lowpass-shaping FIR transmitter [[FIR]] filter and said
outdoor digital enlarged band lowpass-shaping FIR
transmitter [[FIR]] filter and said common digital rejected
image spectrum FIR transmitter [[FIR]] filter stored in
memory banks are programmable filter taps.

Claim 10 (currently amended): The dual-mode
transceiver of claim 9 wherein said indoor and outdoor
digital enlarged band lowpass-shaping FIR transmitter
[[FIR]] filters are programmable to have 51 odd symmetric
filter taps, and said common digital rejected image
spectrum FIR transmitter filter is programmable to have 6
even symmetric filter taps.

Claim 11 (currently amended): A dual-mode
implementation system of a digital lowpass-shaping FIR
transmission [[FIR]] filter comprising:
        a set of memory banks;
        a set of counter units;
        a set of [[MAC]] multiply and accumulate (MAC)
units;
        a pre-addition unit;
        a [[MUX]] multiplexer (MUX) unit; and
        a selectable unit.

Claim 12 (currently amended): The dual-mode implementation system of the digital lowpass-shaping FIR transmission [[FIR]] filter of claim 11 wherein [[the]] input samples are added together with symmetric using said pre-addition unit.

Claim 13 (currently amended): The dual-mode implementation system of the digital lowpass-shaping FIR transmission [[FIR]] filter of claim 11 wherein said MUX unit with said selectable unit is used to select either said memory bank of [[the]] indoor digital enlarged band FIR transmitter [[FIR]] filter coefficients or [[the]] said memory bank of [[the]] outdoor digital enlarged band FIR transmitter [[FIR]] filter coefficients.

Claim 14 (currently amended): The dual-mode implementation system of the digital lowpass-shaping FIR transmission [[FIR]] filter of claim 11 wherein the first stage outputs in [[the]] a data memory bank may be multiplied with [[the]] common digital rejected image spectrum FIR transmitter filter taps [[of]] in [[the]] polyphase memory banks to produce [[the]] outputs for a digital-to-analog (A/D) converter.

Claim 15 (currently amended): The dual-mode implementation system of the digital lowpass-shaping FIR transmission [[FIR]] filter of claim 14 wherein the same a reconstruction analog filter and said digital-to-analog A/D converter are used for both indoor and outdoor UWB transceivers. modes.

Claim 16 (currently amended): A dual-mode indoor and outdoor [[UWB]] ultra wideband (UWB) communication receiver FIR filter comprising:

an indoor digital lowpass receiver FIR filter; and an outdoor digital lowpass receiver FIR filter.

an analog-to-digital (A/D) converter coupled to a dual-mode digital receiver filter;

said dual-mode digital receiver filter further including an indoor digital lowpass finite impulse response (FIR) receiver filter and an outdoor digital lowpass FIR receiver filter;

said indoor digital lowpass FIR receiver filter and said outdoor digital lowpass FIR receiver filter having filter masks including a passband, two transition bands, and a stopband;

two switches; and

said two switches can be controlled to select either said indoor digital lowpass FIR receiver filter for an indoor UWB operation or said outdoor digital lowpass FIR receiver filter for an outdoor UWB operation.

Claim 17 (currently amended): The dual-mode indoor and outdoor UWB communication receiver FIR filter of claim 16 wherein said indoor digital lowpass FIR receiver [[FIR]] filter and said outdoor digital lowpass FIR receiver [[FIR]] filter are programmable to have 39 filter taps with odd symmetric[[.]], and a selectable unit to control said two switches to connect either said indoor digital lowpass FIR receiver filter with said A/D converter or said outdoor digital lowpass FIR receiver filter with said A/D converter.

Claim 18 (currently amended): An article comprising a medium for storing instructions that cause a digital signal processor-based dual-mode indoor and outdoor UWB transceiver to:

Selectively set [[the]] a memory bank of a transmitter filter in the first filtering stage depending on whether an indoor or outdoor UWB transmission signal has been detected; and resulting output of the first filtering stage as [[the]] input samples are filtered by [[the]] a common digital rejected transmitter filter;

Selectively set [[the]] a memory bank of a receiver filter depending on whether an indoor or outdoor UWB receiver signal has been received.

Claim 19 (currently amended): The article of claim 18 further storing instructions that cause a digital signal processor-based dual-mode indoor and outdoor UWB transmitter to control ~~the MUX~~ a multiplexer (MUX) unit to select either the memory bank of [[said]] indoor digital enlarged band lowpass-shaping FIR transmitter [[FIR]] filter taps or the memory bank of [[said]] outdoor digital enlarged band lowpass-shaping FIR transmitter [[FIR]] filter taps to be multiplied with the input samples as [[the]] outputs ~~coupled to~~ followed by [[the]] a polyphase-based digital rejected FIR transmitter filter.

Claim 20 (currently amended): The article of claim 18 further storing instructions that cause a digital signal processor-based dual-mode indoor and outdoor UWB receiver to control [[said]] a MUX unit to select either the memory bank of [[said]] indoor digital FIR receiver [[FIR]] filter

taps or the memory bank of [[said]] outdoor digital <u>FIR</u> receiver [[FIR]] filter taps <u>to be</u> multiplied with the input samples.